

PICTURE OF THE MONTH

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During the spring, on days when the synoptic pattern appeared favorable for severe weather activity, NASA's Applications Technology Satellite, ATS-3, an earth synchronous satellite, was programmed to photograph the Northern Hemisphere at 27-min. intervals to record

characteristic cloud motions preceding the development of tornadoes.

At that time, the ATS satellite was above the Equator at 84°W. at an altitude of 22,300 mi. Figure 1 shows the earth's full disc as recorded by the Suomi Spin Scan Cloud



FIGURE 1.—ATS-3, Apr. 3, 1968, 1446 GMT (0946 EST).

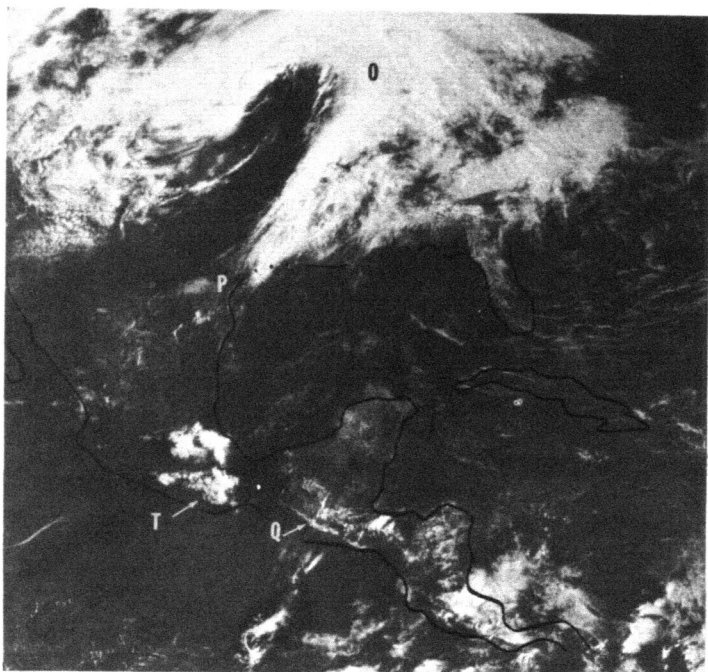


FIGURE 2.—ATS-3, Apr. 3, 1968, 2109 GMT (1609 EST).

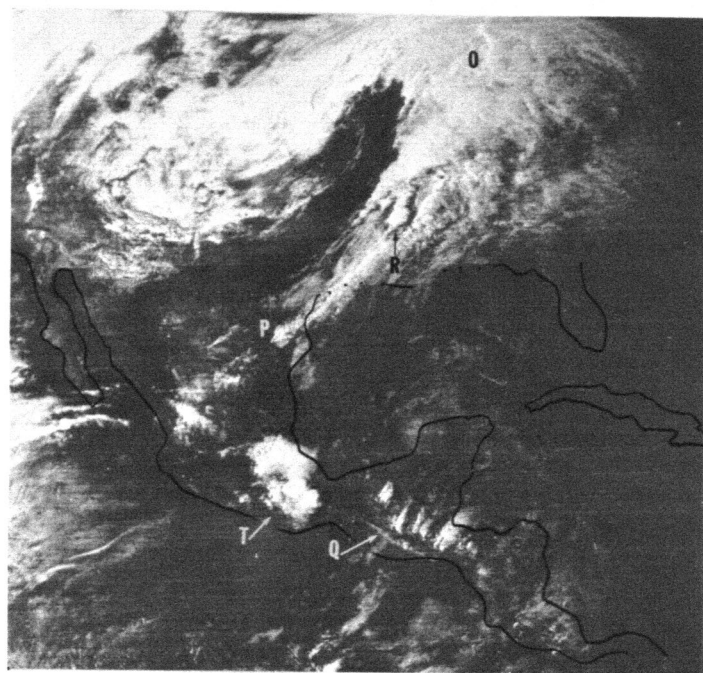


FIGURE 4.—ATS-3, Apr. 3, 1968, 2258 GMT (1758 EST).

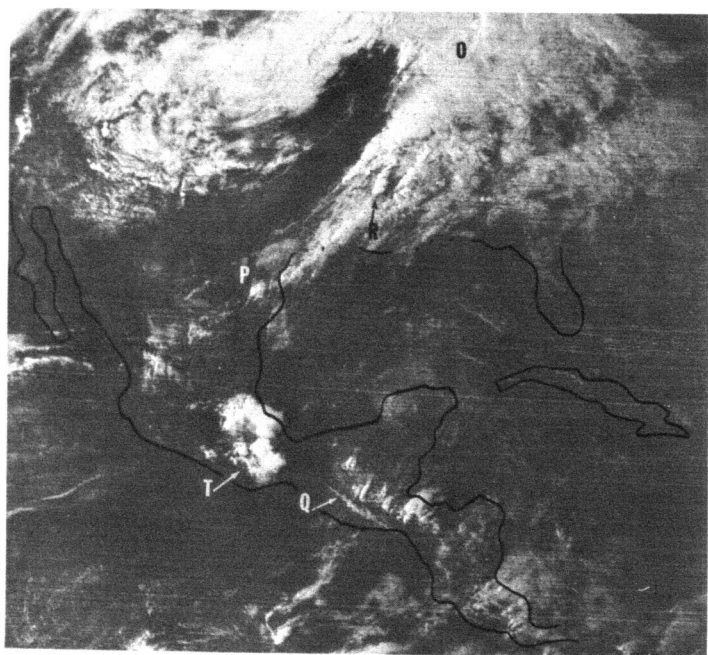


FIGURE 3.—ATS-3, Apr. 3, 1968, 2231 GMT (1731 EST).

Camera on Apr. 3, 1968. Figures 2 through 4 are sectional enlargements of ATS-3 photographs taken later on the same day.

These three pictures show some of the mesoscale changes that occurred in the cloud structure of a deep low pressure area centered over Nebraska. The area of cloudiness

associated with the Low covers most of the eastern United States. During the day, three tornadoes and 10 funnel clouds were reported in Iowa, Oklahoma, and Nebraska.

The most significant feature of this cloud system is the long cloud band (O-P). Radar echoes, observed near the time of the picture in figure 2, indicate cloud tops from 39,000 to 46,000 ft. in the brightest part of the band. Three lines of thunderstorms, which later merge with the main cloud area, can be seen west of O in figure 2.

The most dramatic pictures are those taken at 2231 GMT and 2258 GMT (fig. 3 and 4) while the sun was west of the storm. In these pictures, large shadows cast by the taller cumulonimbus at R can be seen on the lower clouds immediately to the east. Note the growth of this cluster during the 27 min. separating these pictures. Clearing, to the south and west of this cluster during the same interval, is ascribed to subsidence.

Farther south, the development of clouds along the mountain ranges of Central America can be noted. In figure 1, only small clouds are visible over the Sierra Madre del Sur in Guatemala and San Salvador (Q), and the higher Sierra Madre Orientale near Mexico City (T). The large thunderstorm clusters seen at T and Q in figure 4 are the result of orographic lifting and diurnal heating.

Only a few of the changes present in these pictures have been discussed. Dr. T. Fujita of the University of Chicago is preparing time lapse films of these and other ATS photographs taken during tornado situations. Such films will facilitate the study of mesoscale features and their changes over short time periods.